

1970

OPERATING SUMMARY

LABORATORY LIBRARY
ONTARIO WATER RESOURCES COMMISSION

LIBRARY COPY

JAN 21 1972

ONTARIO WATER
RESOURCES COMMISSION

CORNWALL

water pollution control plant

TD
227
C67
W38
1970

c.1
a aa

ONTARIO WATER RESOURCES COMMISSION

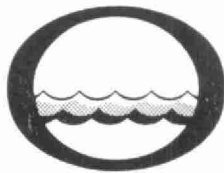
Division of Plant Operations

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at copyright@ontario.ca



Water management in Ontario

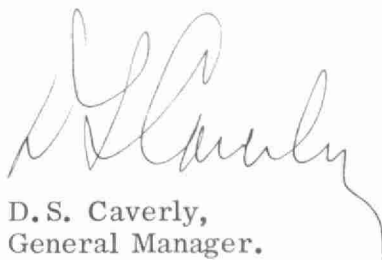
Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario

Once again we have the privilege of submitting to you our latest detailed report on financial progress and technical activity at your water pollution control plant.

The statistical information contained in this annual operating summary will undoubtedly be a useful barometer of efficiency. Of particular interest will be the comments and recommendations of the regional operations engineer, who was intimately connected with day-to-day operation throughout 1970.

Together with the extensive cost data provided, this information should assist greatly in your general understanding of the problems met and dealt with, and in furnishing a yardstick for possible future expansion.



D.S. Caverly,
General Manager.



D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

CONTENTS

Title page.	1
Flow diagram	2
Design data	3
'70 Review	4
Operating costs	6
Process data.	7



Environment Ontario
Laboratory Library
125 Resources Rd.
Etobicoke, Ontario M9P 3V6
Canada

ONTARIO WATER RESOURCES COMMISSION

CHAIRMAN
D. J. Collins

VICE-CHAIRMAN
J. H. H. Root, M. P. P.

COMMISSIONERS
B. E. Brown
F. S. Hollingsworth
Dr. C. A. Martin
D. A. Moodie
L. E. Venchiarutti

GENERAL MANAGER
D. S. Caverly

ASSISTANT GENERAL MANAGERS
K. B. Sharpe
F. A. Voegel
A. K. Watt

COMMISSION SECRETARY
W. S. MacDonnell

DIVISION OF PLANT OPERATIONS

Director
D. A. McTavish

Assistant Director
C. W. Perry

Regional Supervisor
P. J. Osmond

Operations Engineer
J. N. Dick

135 St. Clair Avenue West
Toronto 195

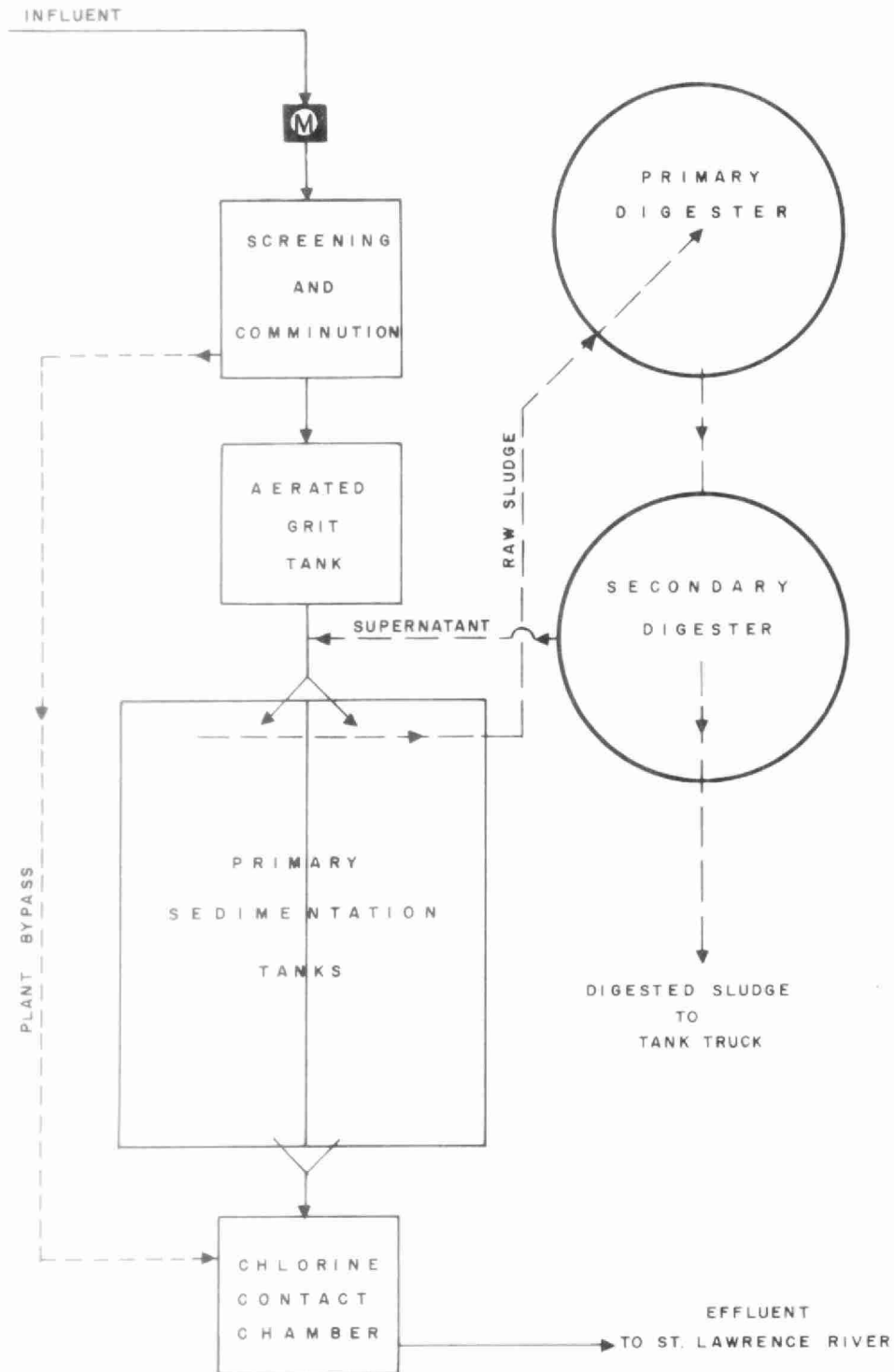
ST. LAWRENCE RIVER

WATER POLLUTION CONTROL CENTRE NO. 1

(CORNWALL)

1970 ANNUAL OPERATING SUMMARY

ST. LAWRENCE RIVER
WATER POLLUTION CONTROL CENTRE No.1
(CORNWALL)



DESIGN DATA

PROJECT NO. 1-0001-66

DESIGN FLOW

8.25 mgd

DESIGN POPULATION

66,000

PRIMARY TREATMENT

Comminution

Type: Barminutor
Size: Two Type "C"

Screening (Bypass channel)

Size: 2" spaces

Grit Removal

Type: Aerated; grit removed by
clamshell bucket
Size: Two 38' 6" x 15' 10" x 13' 5"
swd (98,500 gal)
Retention: 17 min

Air Supply

Type: Hoffman
Size: Two 1,100 scfm (also for channel
aeration)

Primary Sedimentation

Type: Jeffrey
Size: Two 143' x 48' x 12' (1.245
mil gal)
Retention: 3 hours
Loading: Surface, 600 gal/ft²/day
Weir, 14300 gal/ft/day

CHLORINATION

Chlorinator

Type: W & T
Size: One 2,000 lb/day with evaporator

Chlorine Contact Chamber

Size: One 48' 7" x 26' 11" x 10' 6"
(85,800 gal)
Retention: 15 min

OUTFALL

- to St. Lawrence River

SLUDGE HANDLING

Digestion System - Two-stage

Primary Digester -
Type: Perth (gas mixed) with fixed
concrete cover
Size: One 65' dia x 24' swd (82,500
cu ft or 0.515 mil gal)
Loading: 2.88 lb/cu ft/mo

Secondary Digester -
Size: One 65' dia x 24' swd (82,500
cu ft or 0.515 mil gal)
Total Loading: 1.44 lb/cu ft/mo

Disposal

- by tank truck

'70 REVIEW

FLOWS	DAILY FLOW mil gal	OCCURRING IN THE MONTH OF	MONTHLY FLOW mil gal	OCCURRING IN THE MONTH OF
Average	7.35	—	223.9	—
High	12.42	April	372.8	April
Low	5.46	January	169.6	January

GENERAL

The Cornwall water pollution control project consists of an 8.25 IMGD primary treatment plant, a pumping station and interceptor and associated trunk sewers. The following is a summary of some of the more significant operating problems encountered during 1970.

A satisfactory sludge disposal site was located after considerable difficulty was experienced in satisfying all concerned. The new site is in the Township of Charlottenburg about seven miles from the treatment plant.

Problems have been experienced with the Riverfront interceptor sewer regarding occasional overflow of sewage from certain manholes to the river. A program of regular inspection and maintenance of these manholes instituted by the Division of Plant Operations and conducted by the City of Cornwall, has helped to alleviate the problem.

A monitoring system was installed at the Brookdale Avenue stormwater overflow chamber. Overflow at this location is now recorded at the plant pumping station.

The automatic scum collecting system on the primary clarifiers was replaced by a manual type, devised by plant staff. The automatic equipment proved unsatisfactory, particularly in the cold weather.

The windows in the plant administration building were replaced with "Thermopane" glass to reduce the severe condensation problems experienced in cold weather.

Considerable effort was expended to improve the landscaping of the plant grounds.

EXPENDITURES

The cost of operating the project in 1970 was \$127,841.00. This was equal to 94.5% of the budget figure of \$135,000. This represents a cost of \$48.50 per million gallons of sewage or 13 cents per pound of BOD removed. Lower than anticipated costs for chemicals and sundry items accounted for the budget surplus.

FLOWS

The total gallonage of raw sewage treated at the plant was 2687.7 million gallons.

The average daily flow of 7.35 mgd was equal to 89% of the design capacity of the plant. The design daily flow of the plant was exceeded 38% of the time.

PLANT EFFICIENCY

The average concentrations of BOD and suspended solids in the plant influent were 79 mg/l and 117 mg/l respectively. The average concentrations of BOD and suspended solids in the plant effluent were 47 mg/l and 45 mg/l respectively.

The average reduction in the BOD and suspended solids of the raw sewage was 47% and 60% respectively. This degree of treatment represents an improvement over the 1969 results and is quite acceptable for a primary plant.

SLUDGE DISPOSAL

A total of 4.18 million gallons of raw sludge with an average solids concentration of 5.7% was pumped to the digester. A total of 4048 cubic yards of sludge with an average solids concentration of 10.1% were removed from the digesters. This sludge was hauled by truck to drying lagoons in the Township of Charlottenburg. The average volatile solids concentration of 37 indicates that the sludge was well digested prior to removal. It should be noted that this material is of considerable agricultural value. It is planned to have the dried sludge used as a soil fertilizer and conditioner.

CONCLUSIONS

There were no serious operating problems at the Cornwall project in 1970. The quality of the plant effluent remained satisfactory for the primary treatment provided.

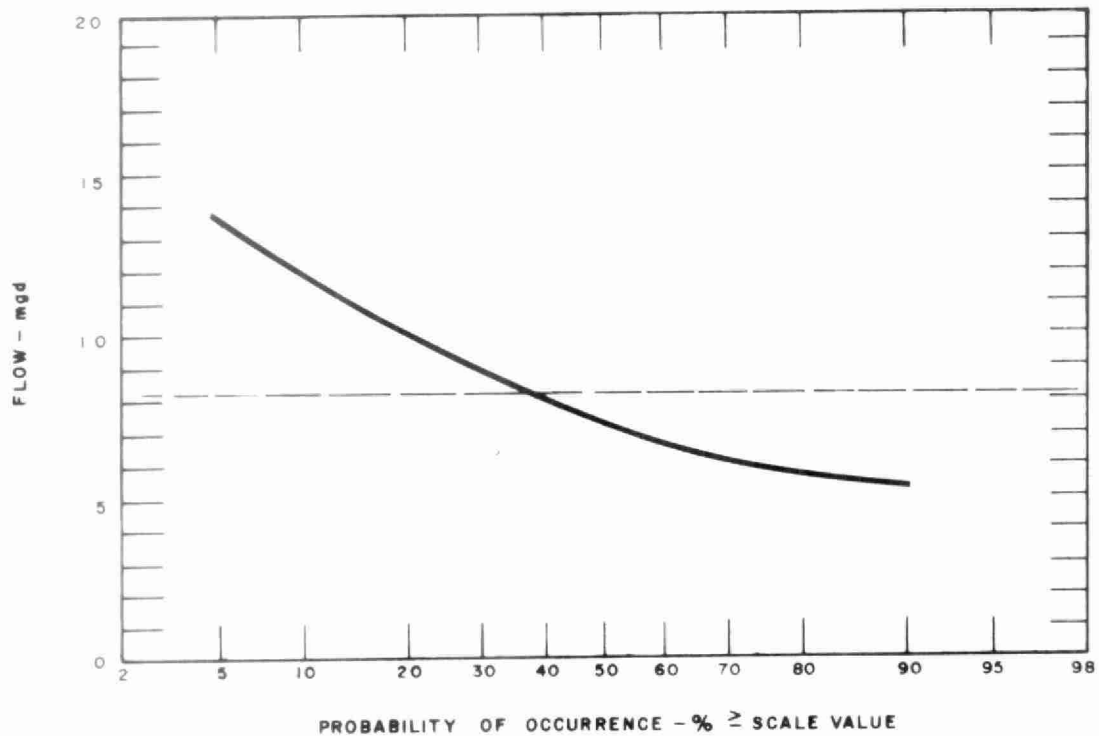
MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	9703.17	7308.99	24.67	-	1567.98	-	174.45	-	455.37	83.71	-	88.00
FEB	11146.73	5177.82	-	137.20	1401.48	-	305.86	1899.08	1337.45	887.84	-	-
MAR	8124.50	4979.67	-	-	1477.98	-	369.86	611.60	-	685.39	-	-
APR	9614.88	4915.49	-	99.27	1699.50	340.20	696.02	390.01	693.26	781.13	-	-
MAY	12322.40	5701.03	197.05	-	1983.00	1260.00	148.31	352.74	543.52	2136.75	-	-
JUNE	10647.40	4889.04	328.21	231.94	1686.00	-	217.73	2821.71	195.12	228.70	-	48.95
JULY	13181.08	4803.22	822.38	285.22	1650.00	1260.00	617.17	2294.40	251.10	1104.34	-	93.25
AUG	11487.90	7063.30	1256.65	-	1563.48	-	501.93	15.70	120.26	773.73	-	192.85
SEPT	11120.53	4426.82	650.36	-	1632.00	1102.50	298.55	125.93	1943.92	940.45	-	-
OCT	9990.05	4400.69	410.76	-	1578.00	-	960.67	537.71	799.10	1151.05	-	152.07
NOV	8899.12	5389.81	-	-	1578.00	-	370.32	477.75	83.39	999.85	-	-
DEC	11603.66	4940.29	-	81.54	3400.68	-	894.62	123.83	859.88	1103.12	-	199.70
TOTAL	127841.42	63996.17	3690.08	835.17	21218.10	3962.70	5555.49	9650.46	7282.37	10876.06	-	774.82

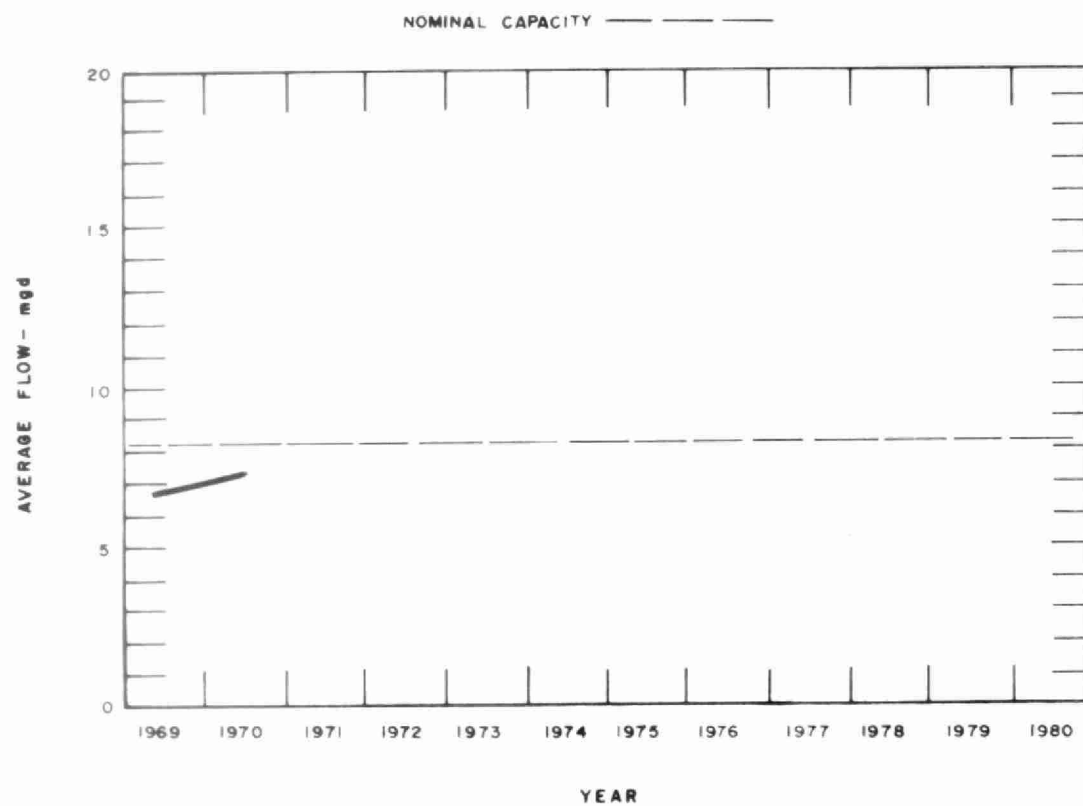
BRACKETS INDICATE CREDIT

* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$7220.10

PROCESS DATA

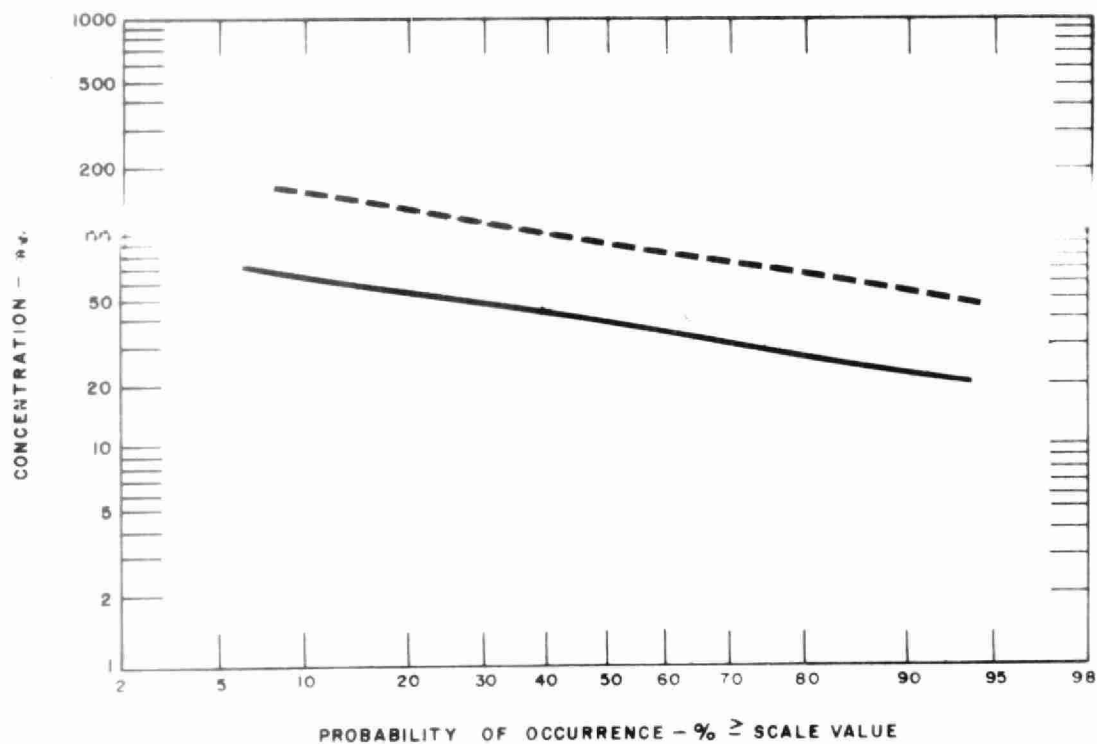


FLAWS

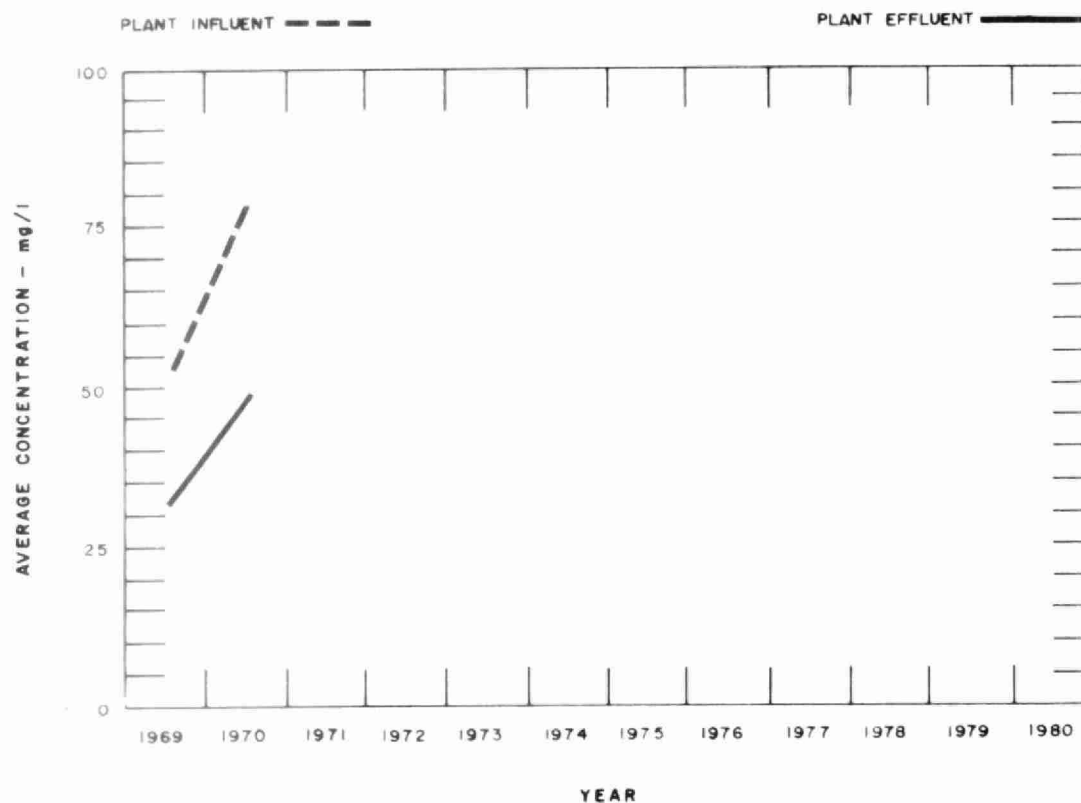


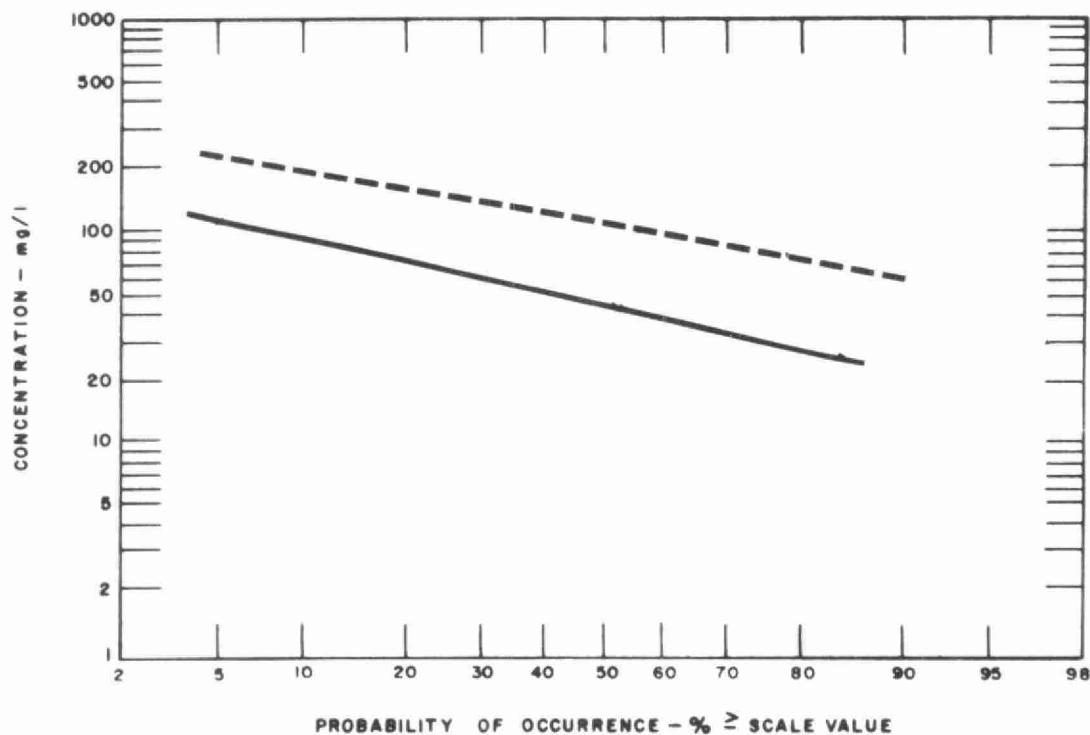
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED 10 ³ pounds	DOSAGE mg/l
JAN	169.6	5.46	8.8	4.6	0	0
FEB	185.8	6.65	11.8	5.1	0	0
MAR	274.6	8.85	18.0	5.7	0	0
APR	372.8	12.42	20.0	8.3	1.6	4.3
MAY	259.6	8.36	10.9	6.7	2.9	2.7
JUNE	196.4	7.56	9.1	4.2	7.3	3.8
JULY	189.0	6.10	8.9	5.2	8.6	4.5
AUG	203.9	6.58	10.1	5.2	13.0	5.9
SEPT	187.0	6.23	10.9	5.0	12.3	6.6
OCT	194.0	6.26	9.7	5.1	2.1	5.6
NOV	246.3	8.22	15.4	5.0	0	0
DEC	208.7	6.74	8.5	5.3	0	0
TOTAL	2687.7	-	-	-	46.8	-
AVERAGE	-	7.35	-	-	-	4.4

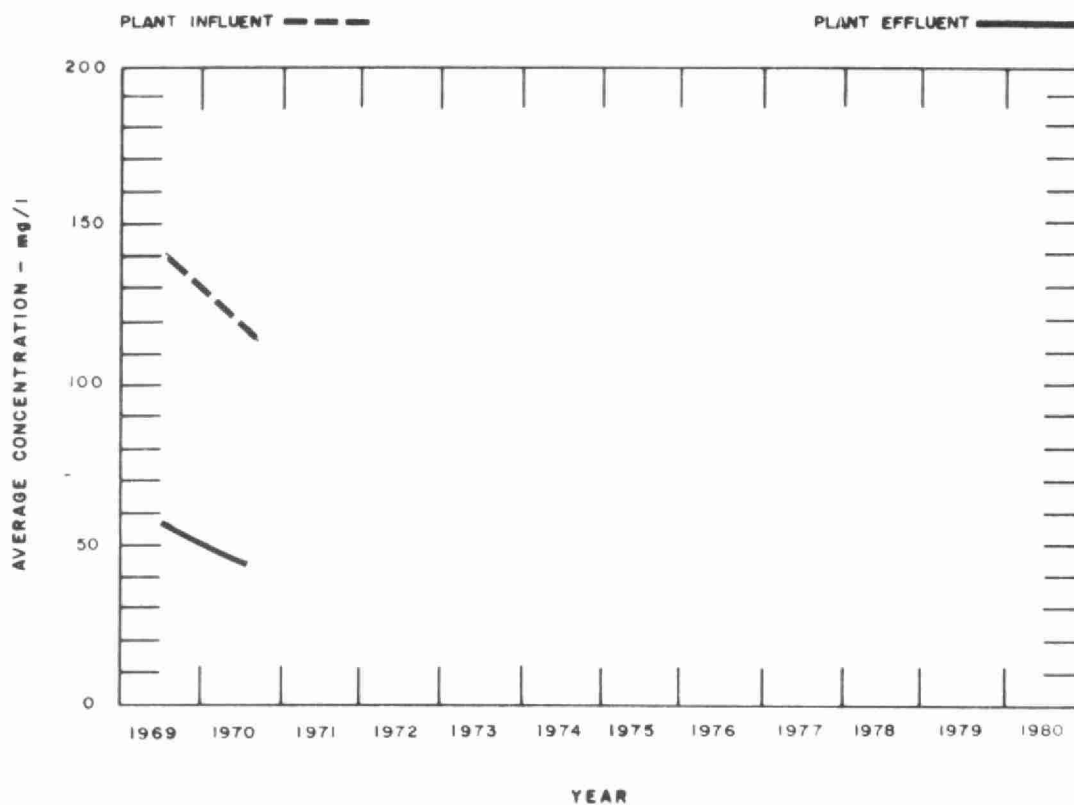


BIOCHEMICAL OXYGEN DEMAND





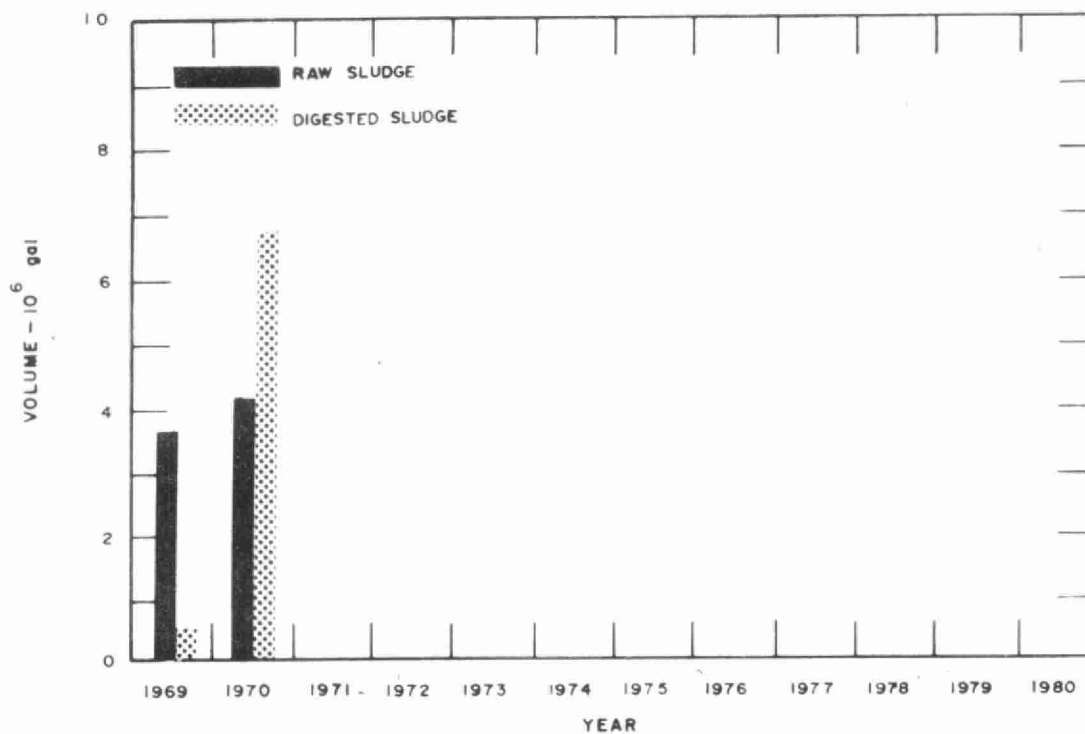
SUSPENDED SOLIDS



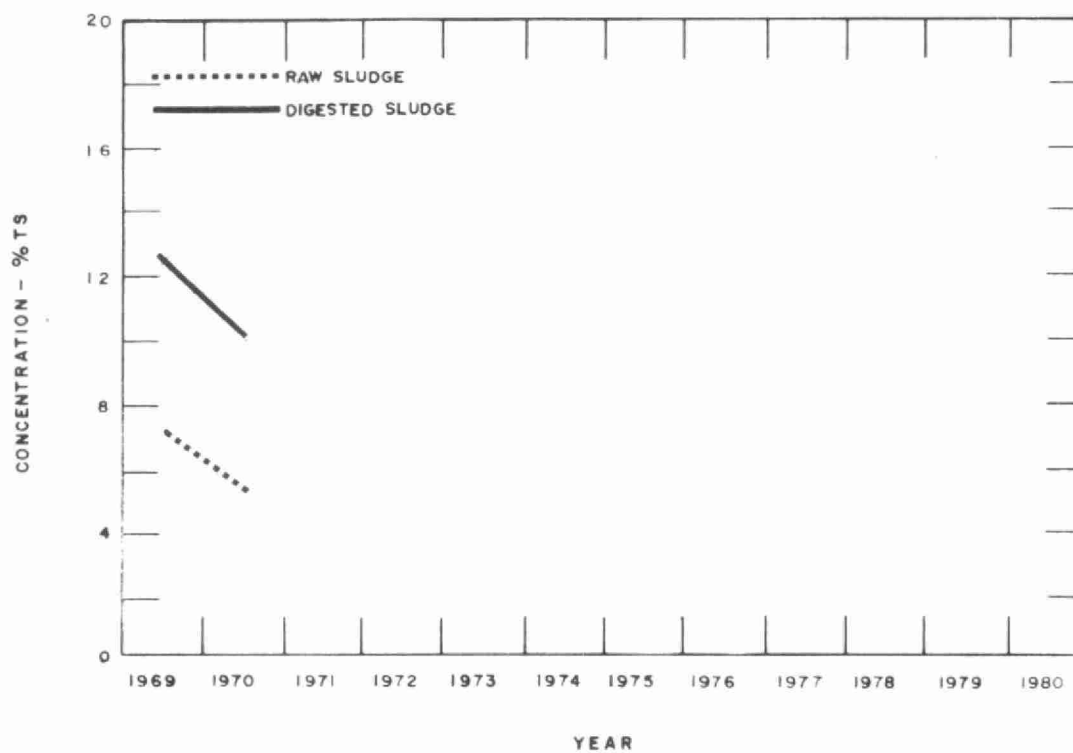
PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND						SUSPENDED SOLIDS						GRIT REMOVED cu ft
	INFLUENT		EFFLUENT		REDUCTION		INFLUENT		EFFLUENT		REDUCTION		
	n	mg/l	n	mg/l	%	10 ³ pounds	n	mg/l	n	mg/l	%	10 ³ pounds	
JAN	2	180	2	39	78	240	7	156	7	64	59	160	0
FEB	2	55	2	40	27	30	7	107	8	40	51	100	0
MAR	2	60	2	44	27	40	11	129	11	60	53	190	24
APR	5	58	5	38	34	70	11	97	11	46	53	190	0
MAY	3	61	3	31	49	80	9	105	9	41	61	170	0
JUNE	7	83	7	52	37	60	10	127	11	44	65	160	0
JULY	6	76	6	53	53	80	6	82	6	29	65	100	108
AUG	6	87	6	59	59	100	10	155	10	48	59	220	6
SEPT	5	80	5	42	48	70	11	107	9	29	73	140	12
OCT	2	81	2	56	31	50	9	121	9	42	65	150	12
NOV	2	58	2	29	50	70	10	106	10	45	58	150	0
DEC	2	85	2	51	40	70	11	105	11	44	58	130	0
TOTAL	44	-	44	-	-	960	112	-	112	-	-	1860	162
AVERAGE	-	79	-	47	44	80	-	117	-	45	60	155	-

NOTE - n is the number of samples taken.



DIGESTION



SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	DEWATERED	LIQUID
	10 ⁵ gal	%	%	10 ⁵ gal	%	%	10 gal	%	cu yd	cu yd
JAN	3.0	5.2	62	4.0	11.9	43	-	.3	-	258
FEB	3.0	6.4	70	6.0	10.0	42	-	.2	-	342
MAR	4.0	4.4	59	7.0	9.8	38	-	.2	-	420
APR	3.0	4.7	59	3.0	13.0	35	-	.2	-	162
MAY	4.0	6.7	55	0	-	-	-	.2	-	0
JUNE	4.0	8.2	49	6.0	11.0	37	-	.2	-	348
JULY	3.0	5.2	61	5.0	-	-	-	.2	-	276
AUG	4.0	6.3	53	8.0	7.6	36	-	.2	-	504
SEPT	-	-	-	9.0	10.3	32	-	.2	-	534
OCT	4.0	4.9	56	7.0	9.8	30	-	.2	-	444
NOV	5.0	6.4	60	8.0	9.0	40	-	.2	-	516
DEC	4.8	4.6	76	5.0	8.6	38	-	.2	-	312
TOTAL	41.8	-	-	68.0	-	-	-	-	-	4116
AVERAGE	-	5.7	60	-	10.1	37	-	.2	-	-

LABORATORY LIBRARY



96936000118579

Date Due

TD/227/C67/W38/1970/MOE
 Ontario Water Resources Co
 Cornwall water
 pollution control plant: aspi
 1970 operating c.1 a aa
 summary



Environment Ontario
 Laboratory Library
 125 Resources Rd.
 Etobicoke, Ontario M9P 3V6
 Canada



Water management in Ontario